

Dear Colleague,

Here is your copy of the *Session Highlights* from our 1998 National UST/LUST Conference held in Long Beach, California from March 29 to April 1. As in previous years, we are providing this document to you so that you can review what went on in the sessions you could not attend. In addition, we know that budget and time constraints prevented some UST/LUST program staff and officials from attending the conference, so we feel sure that a compilation of conference highlights would be of interest to them.

We are distributing several copies of these *Session Highlights* to each State UST/LUST Program Manager, State Fund Administrator, and EPA Regional UST/LUST Program Manager. We are also sending single copies to EPA Regional UST/LUST Branch Chiefs and to some of our international contacts who have expressed an interest in these sessions. Again, I encourage you to share copies with your colleagues in the office who may have been unable to attend the conference. We do not plan to distribute these *Highlights* widely to the regulated community or to the general public.

Please remember that our next conference will be held during March of 1999. We look forward to working with you to develop an interesting, valuable agenda for that meeting. In the meantime, should you have questions about the enclosed *Highlights*, comments on the last conference, or suggestions for the next, please call Peggy Prevost, who heads our National Conference Team, at 703 603-7152.

Sincerely,

Anna Hopkins Virbick, Director
Office of Underground Storage Tanks

Enclosure



The 10th Annual UST/LUST National Conference

Session Highlights



The 10th Annual UST/LUST National Conference

Long Beach, California
March 29 - April 1, 1998

Session Highlights

U.S. Environmental Protection Agency
Office Of Underground Storage Tanks
Washington, D.C. 20460

Foreword

This document is a collection of highlights from notes taken by individual attendees at the 10th Annual UST/LUST National Conference, which was held in Long Beach, California, from March 29 to April 1, 1998. The Office of Underground Storage Tanks compiled these highlights for the benefit of State staff members who were unable to attend the conference. These *Session Highlights* are not an official record of the conference. They contain the opinions of the presenters, do not necessarily represent official Agency position on any issue, and should not be cited or quoted as such.

The highlights are organized along the three tracks of the conference: The UST Track, the LUST Track, and the Program Management Track. Within the tracks, we have ordered the highlights chronologically. For example, the highlights for the UST sessions that occurred on Monday morning start on page UST-1. The highlights for the LUST sessions that also occurred on Monday morning start on page LUST-1. Likewise, the highlights for the Program Management session that occurred on Monday morning start on page PM-1.

Listing Of Sessions

UST Track

Corrosion Protection: Monitoring, Maintenance, and Lining	UST - 1
UST Bloopers	UST - 2
“FLUST”– The Fuzzy Logic UST Game	UST - 3
Determining Performance Of Leak Detection In The Field	UST - 4
EPA Compliance And Enforcement Strategy	UST - 7
State Compliance And Enforcement Strategies	UST - 9
Integrity Assessment: Judgement Day	UST - 10
Safe And Sound Closures	UST - 12

LUST Track

Remediation Technologies	LUST - 1
MTBE: Drinking Water Issues	LUST - 4
MTBE: Impact Of MTBE On State UST Programs/Remediation Methods Update	LUST - 6
Communicating Environmental Risk	LUST - 8
Getting Over The Hump: State RBCA Implementation	LUST - 10
Getting Over The Hump: Fate-And-Transport And Vapor Migration Into Buildings	LUST - 12
Monitored Natural Attenuation	LUST - 15
TPH: Past, Present, Future	LUST - 17

Program Management Track

Bye, Bye Magic 8-Ball; Hello, INDIPAY!	PM - 1
Internet Chat Room	PM - 3
FY 1999-2005: A Program Planning Brainstorm	PM - 5
Hazardous Substance Tanks: The Forgotten Universe	PM - 7
Regulators’ Role In Recognizing And Preventing UST Cleanup Crime And Fraud	PM - 9
The State Of Financial Responsibility And Insurance	PM - 11
Show Us Results And We’ll Show You The Money!	PM - 13

Corrosion Protection: Monitoring, Maintenance, and Lining

Moderator: Ben Singh (Region 2)

Time: Monday, 9:45 - 11:45 a.m.

Notetaker: Cheryl Johnson

Presenters

Lamar Bradley	<i>lbradley@mail.tn.us</i>
Taylor Leon	<i>tleon@steeltank.com</i>
Patrick Rounds	<i>pjr@williams.com</i>
Ben Singh	<i>singh.ben@epa.gov</i>

I. Most important issues or topics actually discussed or presented during this session.

Substandard tanks must be upgraded by December 22, 1998. Cathodic protection can prevent corrosion on the metal surfaces of tanks by using either sacrificial anodes or impressed current. Corrosion protection should be performed by certified corrosion protection experts (*i.e.*, NACE or PE certified); testing should be done according to schedule and by certified individuals. Sacrificial testing must be done 6 months after installation and every 3 years thereafter. The impressed current system must be tested every 60 days.

The tests of cathodic protection systems can yield inaccurate results if the placements are wrong; avoid placements in dry soil, frozen soil, gravel, rock, and vegetation. Some States (*e.g.*, Tennessee) have allowed qualified individuals to become certified CP testers. Tennessee felt that NACE certification was not stringent enough. Keep in contact with your State office because it may have more stringent standards and/or procedures than the Federal standards. Beware of using tank lining as a fast upgrade. There are snake oil salesmen out there who sell corrosion protection using mismatched metals and cheap, quick, and easy schemes that cost more in the long run.

II. Qs and As

Q: If a service station is TOS (Temporary Out of Service) and not in compliance, must it come into compliance by December 22, 1998?

A: Yes, in Tennessee all compliance (TOS or not) must be done by December 22, 1998.

Q: When using the instant off reading system, how long does decay take?

A: Average of 5 to 6 minutes; some systems within 2 to 3 minutes.

III. Suggestions regarding the UST program or requests for assistance.

None.

UST Bloopers

Moderator: Walter Huff (Mississippi)

Time: Monday, 1:00 - 2:30 p.m.

Notetaker: Jay Evans

Presenters

Walter Huff *Walter_Huff@deq.state.ms.us*

I. Most important issues or topics actually discussed or presented during this session.

The session focused on group discussion and activities that attempted to document unusual compliance aspects at UST sites. Attendees reported anecdotes such as: a case where analysis after a leak indicated that the UST operator had over-ridden an ATGS alarm 87 times, refusing to believe a leak was occurring—the result, several hundred gallons of contamination; another case involved excavated but uncleaned, unpurged USTs being used as bombing practice targets by the military.

II. Qs and As

Not applicable.

III. Suggestions regarding the UST program or requests for assistance.

None.

FLUST - The Fuzzy Logic UST Game

Moderator: Ellen Frye (*L.U.S.T.Line*)

Time: Monday, 3:00 - 5:00 p.m.

Notetaker: Cheryl Johnson

Presenters

Lamar Bradley *lbradley@mail.tn.us*
Dave Holtry *holtryd@gwgate.swrcb.ca.gov*
Dave Wiley *wiley.david@epa.gov*

I. Most important issues or topics actually discussed or presented during this session.

The game began with Ellen's handing out about 20 questions to 20 different States. Then she called out the State's name and read the question. The State rep answered the question according to his/her State's regulations, and panel members commented. The questions considered abandonment, remote fill pipe requirements, cathodic protection, above ground piping, monitoring, and other topics. The game proved that one size does not fit all; States vary in their perceptions. What is acceptable for one State may not be acceptable to another. A number of questions remained fuzzy when the game was over.

II. Qs and As

Q: If a farmer has two 1,000-gallon tanks that are manifolded together is he subject to federal regulations?

A: Tennessee says these are two separate tanks and should be treated as two separate tanks. California concurred. But some States said that the tanks should be treated as one tank and be regulated.

Q: If a tank is in a basement and completely or partially backfilled with sand, is it an AST or an UST?

A: In Pennsylvania the tank would be considered an UST. Other State reps said it was an AST and should not be regulated as an UST.

III. Suggestions regarding the UST program or requests for assistance.

There was a suggestion for having some sort of central information exchange for questions like these, so that a State confronted with a fuzzy question could learn how other States had approached it.

Determining Performance of Leak Detection In The Field

Moderator: Shahla Farahnak (California)

Time: Tuesday, 8:30 - 10:30 a.m.

Notetaker: Kate Becker

Presenters

Shahla Farahnak	<i>farahas@gwgate.swrcb.ca.gov</i>
Salim Douglass	<i>s.douglass@occmil.occ.state.ok.us</i>
Harry Topping	<i>htopping@tuthill.com</i>
Thomas Young	<i>tyoung@ucdavis.edu</i>

I. Most important issues or topics actually discussed or presented during this session.

Salim Douglass from the Oklahoma Corporation Commission discussed Oklahoma's study of 373 tank owners who applied to the Indemnity Fund over a 2-year period. Basically, Oklahoma wanted to learn what caught a leak: Was it leak detection or something else? Of the tanks with leak detection: 31 percent were liquid wells; 26 percent used tank tightness testing (TTT) with inventory reconciliation; 19 percent were vapor wells; 10 percent used SIR; 6 percent used TTT or inventory reconciliation (not both); and the remainder used a variety of other methods. Of the tanks with line leak detection: 42 percent were not required to use it; 33 percent used line tightness testing; 9 percent did not submit; 8 percent used vapor monitoring; 6 percent used SIR; and the remainder used liquid monitoring. Of the 107 owners/operators who failed substantial compliance and, therefore, were not admitted into the Fund: 28 had inadequate inventory reconciliation; 27 had no line leak detectors or were not inspected; 25 didn't submit the paperwork; 22 had vapor monitoring wells; and many failed for administrative reasons. Of the over 450 owners/operators reporting releases: 207 reported the release as a result of a site assessment (usually associated with the sale of the property); 36 as the result of leaking lines; 30 because of high vapor readings in their wells; and the rest for a variety of reasons. As noted, a site assessment is the primary reason a release is reported. Why are leaks not detected by leak detection? Possibly because site assessment detects contamination that has accumulated from historical spills and overfills or from releases that were within leak detection tolerance limits; because tank owners are engaging in faulty leak detection techniques or not implementing any leak detection; or because site assessment caught leaks at sites that did not require leak detection.

Shahla Farahnak from California discussed the results of a California survey evaluating the effectiveness of leak detection from USTs. The data base was 345 tanks. 84 percent of the leaks (263) were found during closure; 15 cases were discovered as a result of leak detection; 35 were discovered as a result of other methods; for the remainder, there was no information. Tank tightness testing led to discovering eight leaks; at two sites, a fail was followed by a pass with no reason given. California concluded that most leaking sites involve old (10 to 40 years), single-walled tanks; almost all leaks were found during closure; most leaking sites had not been monitored; indication of improperly conducted tests and incorrect reporting of test results by vendors and owner/operators was noted; indication of "fail" or "inconclusive" was ignored. California's recommendations included enforcing consistent use of leak detection and periodic tests; documenting why tanks failed; conducting a more detailed survey; basing the new survey on future tank closures and upgrades; and using dispenser containment. California learned: Set goals and ask the right questions in the survey questionnaire; actively solicit the missing data; implement a screening criteria; distinguish between the date of discovery and the date of the leak; note that the frequency of use of the monitoring method is important for evaluating the effectiveness of the method; and pinpointing the source of the leak may be difficult.

Tom Young from the University of California/Davis explained a study he would like to conduct. The goals of this study would be to determine leak detection performance ($P_D P_{FA}$) in the field and to identify the sources of failure to meet performance standards. The ideal study would have researchers wait for routine leak detection to be performed; dig up the tank and check for leaks; and then see if the leak detection was correct. Nobody can do that. Tom has designed a study that is technically sound and statistically valid. The technically sound criteria is satisfied by having conclusive leak status, recent leak tests, and indications of reason for leak detection failure; the statistically valid criteria is met by comparing the data to performance standards; random sampling, and including a large enough sample size. The study approach will have the inspector completing the survey at closure/upgrade. The status of the study is that it is currently awaiting EPA approval and needs State/local participants; Tom would

like to collect data during the summer. Tom noted that the California project, with which he is also involved, is currently being reviewed by the Governor's MTBE Advisory Panel. This study will examine the protection offered by the 1998 upgrade standards. The survey form, which was designed with ease of response in mind, is a one-page check-box format. If your State is interested in being a part of the study, please contact Dave Wiley in OUST (wiley.david@epa.gov).

Harry Topping, from EMCO Electronics, spoke about how to check your equipment. Equipment is being updated and improved constantly; users of the equipment may not be familiar with it. Harry started by discussing monitors. Use monitors manufactured after January 1995 because they have printers built in. When you turn on the monitor, it runs diagnostics; these diagnostics do not, however, include the test probes. For safety, always check to make sure that the ground wire is in place before checking the sensors. He showed us a leak test report and inventory report and explained how to read them. He showed us labeled drawings of a variety of probes and explained how to use them. Magnetostrictive probes are the most common; most of them have diagnostics. Ultrasound probes have no moving parts, are low maintenance, but must be clean. Capacitance probes have no moving parts, measure the fuel's ability to conduct, but don't work for precision tests when alcohol is in the petroleum or when algae inhibitors are in truck fuel. The diagnostic tests these probes run are difficult to read. Capacitance probes can be dented, and the glass tube inside them can break. For double-wall steel tank sensor re-installation, make sure that the sensor reaches the bottom of the tank. For double-wall fiberglass tank sensor installation, make sure that the pull string is in place before pulling on it. The only way you know the sensor is in the right spot is by knowing the diameter of the tank. Then pull out the string and measure it.

II. Qs and As

Q: (for Shahla Farahnak) Did California ask if the owner/operators understood the leak detection regulations?

A: No. We gave public workshops, but owners said they still didn't know. We left it to local agencies to catch.

Q: Did your study reveal who (*i.e.*, the owner/operator or the vendor) performed the actual leak detection?

A: Most times it was the vendor.

Q: What is the ratio of inspectors to UST facilities?

A: It varies. Inspections varied throughout the year. It is hard for California to collect data because we have so many agencies to collect the data from.

Q: (for Tom Young) How do you plan to filter out the "noise" (acceptable leaks below threshold)?

A: We can't; filtering out these data would cost too much. However, with lots of data we should be able to obtain robust results.

Q: (for Harry Topping) Is the leak test report only for tanks with product in them?

A: Yes

Q: Can you program automatic tank gauging to deliver only State-level data?

A: Yes

Q: On your double-wall steel tank sensor installation, how do you "make sure" that the sensor reaches the bottom of the tank?

A: It's tough. Use a flashlight to look into the tank. The sensor may never have been installed properly.

III. Suggestions regarding the UST program or requests for assistance.

None.

EPA Compliance And Enforcement Strategy

Moderator: David Nielsen (OECA) and Irv Auerbach (OUST)

Time: Tuesday, 11:00 a.m. - 12:30 p.m.

Notetaker: Jerry Parker

Presenters

Irv Auerbach
David Nielsen

auerbach.irwin@epa.gov
nielsen.david@epa.gov

This session was an opportunity to discuss a draft enforcement policy. Based on this and other discussions, EPA is in the process of formalizing the strategy. EPA hopes to make this policy available in early summer.

State Compliance And Enforcement Strategies

Moderator: Irv Auerbach (OUST)

Time: Tuesday, 2:00 - 3:00 p.m.

Notetaker: Jerry Parker

Presenters

Art Nash	<i>nasha@state.mi.us</i>
Dale Stottlemeyer	<i>stottled@columb26.dhec.state.sc.us</i>

I. Most important issues or topics actually discussed or presented during this session.

Art Nash presented Michigan's approach to the 1998 deadline. The emphasis there was on getting the regulated community alerted and prepared to meet the requirements in plenty of time.

Dale Stottlemeyer presented South Carolina's approach. His State vigorously pursued outreach on the 1998 requirements, meeting with almost all the owners/operators in the State, so that no one could legitimately claim that he/she was not aware of the requirements.

There was discussion on how to get the regulated community ready. Ideas included using available and customized outreach materials, holding public forums for owners/operators, and sending reminder notices with annual tank fees.

II. Qs and As.

Q: If names of violators are put on the Internet, how will that be kept current?

A: It will be updated weekly.

III. Suggestions regarding the UST program or requests for assistance.

None.

Integrity Assessment: Judgement Day

Moderator: David Wiley (OUST)
Time: Wednesday, 8:30 - 10:00 a.m.
Notetaker: Paul Miller

Presenters

Jim Lary	<i>jtlary@juno.com</i>
Derick Sharp	606-654-8265
David Wiley	<i>wiley.david@epa.gov</i>

I. Most important issues or topics actually discussed or presented.

David Wiley discussed the regulatory history of integrity assessment. All existing steel tanks without corrosion protection must be assessed to ensure the integrity of the tank prior to adding corrosion protection. The regulations specifically discuss internal inspection and tank tightness testing (for tanks less than 10 years old only). In addition, methods determined by the implementing agency to be no less protective than those already listed in the regulations may be used. There are currently three alternative technologies in the industry—the video camera, ultrasonic robotic inspection, and non-invasive (using external site-specific characteristics to determine the integrity of the UST). Last year, OUST issued guidance that recommended that implementing agencies either follow a standard code of practice for the use of these technologies or submit the technologies to third-party evaluation. Currently, there is no existing standard that addresses the technologies; only one vendor has presented a third-party evaluation to EPA.

Derick Sharp discussed internal inspection as a method of integrity assessment. Currently, there are two standards for conducting an internal inspection (NLPA 631 and API 1631). Mr. Sharp presented an affidavit that he had prepared for assessing and upgrading with cathodic protection and indicated that he believes the cathodic protection industry needs to specify a tank life following the addition of cathodic protection.

David Wiley provided an update on the proposed standard guide for three methods for assessing buried steel tanks. The draft standard was recently balloted and on March 13, 1998, the subcommittee (G01.10) discussed the issues raised from this ballot. The next step is to send the recommendations of the subcommittee to the full G01 committee for balloting. This step will occur in April.

Jim Lary discussed Corpro's Mean Time to Corrosion Failure non-invasive method for assessing a buried steel UST prior to adding cathodic protection. As of April 1, 1998, Corpro is the only vendor to submit a third-party evaluation for its methodology.

II. Qs and As.

Q: (for Derrick Sharp) (from Arizona) Where did you come up with 50 years as the tank life in your affidavit? Why is the lining industry writing an affidavit for corrosion experts?

A: That number was to get the regulator's attention. There needs to be a tank life stated after the addition of cathodic protection.

Q: (from Massachusetts) Are all cathodic protection upgrades impressed current?

A: (Jim Lary) There are a few upgrades going on where sacrificial anodes are being used, but applying impressed current is strongly recommended for existing bare steel tanks. Sacrificial anodes should only be used when you have a well-coated structure.

Q: (from Nevada) What do you do with people who add cathodic protection and have never had an integrity assessment conducted?

A: This issue should be addressed on a case-by-case basis.

III. Suggestions regarding the UST program or requests for assistance.

None

Safe and Sound Closures

Moderator: David Wiley (OUST)
Time: Wednesday, 10:30 a.m. - 12:00 noon
Notetaker: Paul Miller

Presenters

Bill Greer *bill_greer@msn.com*
David Wiley *wiley.david@epa.gov*

I. Most important issues or topics actually discussed or presented.

Bill Greer discussed the need to perform safe closures. He started with the fire triangle—the three components needed to start a fire (*i.e.*, fuel, oxygen, and an ignition source). Eliminate any one of the three and you remove the danger of fire. He next discussed the results of a survey given to UST contractors. Some results are presented below:

- How is your work divided?
 - Field work on new installations - 43 percent;
 - Upgrades - 31 percent; and
 - Closures - 21 percent.
- What method is being used for making tanks safe prior to closure?
 - Diffuser - 22 percent;
 - Air eductor - 31 percent;
 - Dry ice - 37 percent;
 - Compressed gas - 9 percent; and
 - Nothing - 1 percent.
- What do you do with old piping?
 - Remove it - 65 percent;
 - Flush it out and cap it in place - 34 percent;
 - Fill it with an inert material - 1 percent.
- How is the tank prepared for disposal?
 - Cut it open and clean it thoroughly - 48 percent;
 - Rinse it - 20 percent;
 - Pump out product only - 32 percent.
- How many people are killed each year doing tank closures?
 - <5 - 22 percent;
 - 5-10 - 25 percent;
 - 11-15 - 16 percent;
 - 16-20 - 6 percent;
 - >20 - 31 percent.

David Wiley discussed the North Carolina Abandoned Tanks Study. There are an estimated 3200 to 4000 abandoned USTs in North Carolina. This translates to about 1 site per 24 miles of roadway or 5 sites per 10,000 people. Approximately 44 percent of these sites are contaminated.

II. Qs and As.

Q: (from Wisconsin) (for Bill Greer) Is there information on hazardous substance tanks provided in your survey?
A: Most survey respondents only dealt with petroleum tanks. The key for hazardous substance tanks is to know what the hazardous substance is (both current and historic) and to clean the hazardous substance out of the tank.

Q: (from Michigan) (for Bill Greer) Do your members carry pollution liability insurance?

A: About 1/3 do, and it is approximately 2 million in coverage.

Q: (from Delaware) (for Bill Greer) What is your view of OSHA?

A: OSHA plays a very important role in training.

III. Suggestions regarding the UST program or requests for assistance.

None

Remediation Technologies

Moderator: Gilberto Alvarez (Region 5)

Time: Monday, 9:45 - 11:45 a.m.

Notetaker: Kate Becker

Presenters

Gilberto Alvarez	<i>alvarez.gilberto@epa.gov</i>
Vincent Dick	<i>vbd@haleyaldrich.com</i>
Stephen Koenigsberg	<i>shruti@regenesi.com</i>
John Wilson	<i>wilson.johnt@epa.gov</i>

I. Most important issues or topics actually discussed or presented during this session.

Gilberto Alvarez began the session by reading part of the ASTSWMO Report Card on the Federal UST/LUST Program and commenting on how clear, complete, and concise it was. He acknowledged that staying current on the latest applications in LUST remediation is time consuming. To help regulators out, he engaged speakers to discuss blast fracturing, Fenton's reagent, and oxygen release compounds. In a survey of States, these technologies were picked as the top three that we "need to know more about." Each speaker discussed site screening, pilot tests, advantages, limitations, costs, implementation, post remediation monitoring, State acceptance, and implications to State policies.

Vince Dick of Haley and Aldrich in Rochester, New York, talked about bedrock blast fracturing for groundwater remediation. He showed videos of actual blasts and narrated them. According to Vince, costs tend to come down although they vary with location. In the length method, costs range from \$120 to \$250 per linear foot. In the side wall method, costs range from \$3 to \$5 per square foot. Background data requirements include building drawings; identification of vibration-sensitive operations, equipment, and facilities; local codes; nature and location of underground utilities; facility schedules (including planned shutdowns); and pre- and post-blast surveys. Contingency planning includes blasting specification development; pre- and post-blast surveys; test blast program and blast round design refinement; and shutdown of vibration-sensitive operations. The potential facility impacts are elastic ground vibrations, non-elastic ground heave, and rock block movement. Vince laid out an implementation schedule and plan; he stressed the need to be careful. He ended his presentation with a brief discussion of bedrock refractive-flow cells: a passive treatment analog to funnel-and-treat.

Gilberto Alvarez discussed LUST applications of Fenton's reagent—an H_2O_2 /catalyst mixture that is used in the wastewater industry. Its chemical reaction creates a hydroxyl radical (OH ion) that cleaves hydrocarbons. It converts hydrocarbons to CO_2 and H_2O (steam); it causes the pH to drop. It is different from hydrogen peroxide treatments. Fenton's reagent is being used in some States, mostly along the East Coast. It is used by direct injection or time-lapsed injection in existing wells or injection wells. The by-products are measured before as well as after BTEX (or other chemical of concern [COC]) measurements. Some considerations include preferential pathways (very important), mass balance, free product, type of free product, and UIC permitting issues (*e.g.*, secondary SDWA levels). In addition, using Fenton's reagent can cause an UST and its associated piping to warm up, odors to be created, and interference with other methods. Know what has been used at your site before using Fenton's reagent. Region 5 guidelines for using Fenton's reagent include not using it where fumes or free product have been detected, conducting an adequate site characterization before using it, and using it only at appropriate sites. (In *How To Evaluate Alternative Technologies For Underground Storage Tank Sites: A Guide For Corrective Action Plan Reviewers (EPA 510-B-94-003)*, note the chapters on air sparging and soil vapor extraction.)

Steve Koenigsberg from Regenesi Bioremediation Products discussed oxygen release compounds. Basically, ORC (oxygen release compound) (a product of Regenesi) is a proprietary time-release formulation of magnesium peroxide (MgO_2). Time release allows the retardation of some of the byproducts. When the MgO_2 powder is mixed with water, oxygen is released, milk of magnesia is formed, and moderate pH levels are maintained. ORC can be used in the saturated zone as a cost-effective method of attacking the contaminants and on excavated tanks to remediate residual sorbed material and protect the floor of the excavation from re-contamination. It can be used in localized remediation/monitoring well conversion to clean up hot spots, reduce the cost of monitoring, and promote remediation. And, it can be used to create an oxygen barrier to cut off developing plumes, limit their

spread, and protect property lines. Steve discussed several case studies that had used ORC. ORC may be applicable at sites with contamination from MTBE, PAHs, PCP, and vinyl chloride.

John Wilson from the National Risk Management Research Laboratory in Ada, Oklahoma, spoke about the efficacy of ORC for containment of BTEX plumes in groundwater contaminated by fuel spills. He said that when ORC slurries covered socks in old monitoring wells, the prospects for success were dim. When used with socks or briquets in a treatment well, the prospects for success were effective at low BTEX concentrations. When used with pencils, the prospects for success were fair in the short term and poor in the long term. When used with funnel and gate with cassettes or socks in the gate, the prospects for success were adequate (may work well). The treatment of a BTEX plume requires closely spaced wells. The theoretical design spacing is much closer than any spacing of conventional monitoring wells at a site. It is hard to get enough oxygen into the water. Treatment was only effective when the BTEX loading was below 5 mg/L. Only 10 percent of the ORC was used to biodegrade BTEX. Native organic matter or reduced minerals in the aquifer may have exerted a considerable oxygen demand.

II. Qs and As

Q: (to Gilberto Alvarez regarding Fenton's Reagent) Would it work for DNAPLS?

A: Yes.

Q: For fluctuating water tables?

A: Yes, especially if the majority of the smear zone of heavy contamination is exposed.

Q: How do you get the pH back to normal?

A: It goes up by itself.

Q: How high will the temperatures get as part of the reaction?

A: One of the studies I reviewed showed an increase to about 120°F.

Q: Are Wisconsin and Florida guidance documents on the www?

A: Not yet, but we plan on working through OUST to get them posted.

Q: Are the costs higher or lower?

A: I would expect them to be lower, especially compared to longer term remediation systems.

Q: Does Fenton's Reagent also work on TPH?

A: It could, but I usually do not recommend TPH measurements as part of a site investigation, because of RBCA considerations.

Q: (to Vince Dick regarding blast fracturing) How far do you drill down?

A: To the bottom of the zone of contamination.

Q: Do fracture yields maintain over time?

A: At one facility they have maintained at 50 to 30 gpm over time.

Q: Do you use fracturing to stall the plume or for source removal?

A: Both. But, you have to be careful with the explosion. It depends on how the trenches are configured.

Q: Have you done cost comparisons between pneumatic and blast fracturing?

A: No.

Q: (to John Wilson) What is the difference between monitoring and treatment wells?

A: A treatment well may have a sock on it, so it reads cleaner.

Q: Have you seen any fouling of wells?

A: (Steve Koenigsberg) Yes, so we added plastic at the screens. The socks got stiff and hard from iron fouling.

Q: (to Steve Koenigsberg) Are you moving toward injection?

A: Yes, because of costs and not because of the maintenance necessary for the wells.

Q: What happens to the spent slurry?

A: It forms "spider webs."

Q: I see lots of abuses. Do you have any follow up data on the New Mexico site?

A: No. There was no provision made in the company's budget for collecting this kind of data. Rebound will occur if we pull the wells.

Q: How long do you wait?

A: About 1 year after we put in the ORC plus the travel time of the groundwater.

III. Suggestions regarding the UST program or requests for assistance.

None

MTBE: Drinking Water Issues

Moderator: Robert Hitzig (OUST)

Time: Monday, 1:00 - 2:30 p.m.

Notetaker: Sammy Ng

Presenters

Steve Book	<i>sbook@dwemb.dhs.cahwnet.gov</i>
Robert Hitzig	<i>hitzig.robert@epa.gov</i>
Mike Osinski	<i>osinski.michael@epa.gov</i>

I. Most important issues or topics actually discussed or presented during this session.

The 1990 Clean Air Act Amendments require use of oxygenates.

Thirty percent of the nation's gasoline is Reformulated Gasoline (RFG)

- MTBE is used in 76 percent of RFG.
- MTBE is used in 15 percent (by volume) for the winter fuel program.
- MTBE production has increased tremendously in last 15 years.
- According to the California Air Resources Board, there has been significant improvements in air quality since MTBE has been used.

Compared to BTEX, MTBE is

- More volatile and
- Less subject to bioremediation.

EPA Advisory issued in December 1997 described MTBE's

- Chemical and physical properties,
- Toxicokinetics,
- Health effects,
- Organoleptic effects, and
- Characterization of dose response and hazard.

No human studies

- Is not a known carcinogen;
- People can adapt to the taste and odor of MTBE; higher levels are required for some people to detect;
- Different people have different thresholds for taste and odor.

II. Qs and As.

Q: Are there other oxygenates that we should be concerned about?

A: Other oxygenates are used, but in much lower proportions than MTBE. We should test for these also.

Q: Do you find MTBE from heating oil tanks?

A: It is not intentionally mixed into heating oil, but MTBE has been found at sites where there has been a release of heating oil. Because MTBE is normally not used (and not needed) in heating oil, there is question of where the MTBE came from.

Q: How did the California UST program and the Lawrence Livermore Lab react to the findings of MTBE in California's drinking water?

A: The California UST program is very concerned. Lawrence Livermore did not ignore MTBE in its original study; it was not a study parameter. They are looking at it now.

Q: Is MTBE found only in gasoline delivered to non-attainment areas or to the entire state?

A: It can be anywhere. You never know until you do analysis.

III. Suggestions regarding the UST program or requests for assistance.

None

MTBE: Impact Of MTBE On State UST Programs/Remediation Methods Update

Moderator: Robert Hitzig (OUST)

Time: Monday, 3:00 - 5:00 p.m.

Notetaker: Sammy Ng

Presenters

Paul Bauer	<i>pbauer@dep.state.nj.us</i>
James Crowley	<i>jimc@scvwd.dst.ca.us</i>
James Davidson	<i>JimDavidson@compuserve.com</i>
Robert Hitzig	<i>hitzig.robert@epa.gov</i>
Jeffrey Kuhn	<i>jkuhn@mt.gov</i>

I. Most important issues or topics actually discussed or presented during this session.

The University of Massachusetts (UMass) conducted a study to gauge the impacts of MTBE on State programs and to determine whether or not States have developed effective methods for dealing with MTBE. If States have developed methods that are effective, what are they? To find out, UMass sent a questionnaire to LUST program managers in all 50 States and the District of Columbia. Responses were received from 49 of 51 recipients. (California and Indiana did not submit data.) Some of the results are as follows:

- 27 States currently require analysis for MTBE; 8 other States perform MTBE analysis at a significant number of sites; only 14 States are not analyzing for MTBE.
- 12 States find MTBE at 80 to 100 percent of their sites; 7 States find MTBE at 0 to 20 percent of their sites.
- 5 States report finding MTBE in waste oil, diesel, jet fuel, heating oil, and aviation fuel.
- 20 States report detection of MTBE at sites without documented releases from UST (possibly from gasoline from lawn mowers, old releases, or overfill catch basin leaks).
- The most successful technology for soil remediation is soil vapor extraction.
- The most successful groundwater remediation technologies are pump-and-treat and air sparging.
- Of the 49 response, 26 States report closing sites contaminated with MTBE. 34 States also reported that they have not reopened MTBE sites; 6 states have done so.

The Santa Clara Valley Water District is concerned about MTBE because of its:

- Persistence (essentially non-degradable)
- Mobility (highly mobile; no retardation)
- Solubility (4.3 percent or 43,000 mg/l)
- Large volume in use (11 percent of total gasoline)
- Rate of spillage
- Impact/toxicity/cleanup goal
- Impacts on beneficial uses of water supply

MTBE contamination means the Water Agency must:

- Find another source of water for customers and treat own water supply;
- Explain the situation to customers; and
- Provide resources for staff to develop treatment plans and presentations to the public and media.

MTBE is a concern in New Jersey because:

- State is densely populated.
- 60 percent of the population relies on groundwater for potable supply.
- 400,000 private potable wells in State.
- Reformulated gasoline has been used in State since 1979.
- Impacts on 2400 groundwater corrective action cases
 - 80 percent have MTBE over 70 ppb
 - 400 private wells are impacted

- 65 public wells impacted
- Impacts on remediation
 - depends on level of risk
 - sites with high or moderate levels of risk are actively remediated
 - low-risk sites are modeled and monitored (and use institutional controls)

Summary of remediation technologies (data from 14 sites located in California, Florida, Massachusetts, New Jersey, Vermont, and Wisconsin)

- Subsurface MTBE plumes can be remediated using existing methods.
- Pumping is reliable and very effective for MTBE removal.
- Air stripping is robust, reliable, and (usually) least expensive (needs air:water ratio of >150:1)
- Water treatment by granulated activated carbon (GAC) usually most expensive and troublesome.
- Soil vapor extraction (SVE) should work very well if applied soon after spill; also beneficial as a supplement to pump-and-treat.
- Treating vapor-phase MTBE (from air stripper or SVE systems) can be challenging and significantly raise costs.
- Air sparging will volatilize MTBE; overall benefits are unclear. Biosparging is even less clear.

II. Qs and As.

None (each presenter had extensive handouts)

III. Suggestions regarding the UST program or requests for assistance.

None

Communicating Environmental Risk

Moderator: Peg Rogers (OUST)

Time: Tuesday, 8:30 - 10:30 a.m.

Notetaker: Steven McNeely

Presenters

Susan T. Brown *brownta@aol.com*

I. Most important issues or topics actually discussed or presented during this session.

According to Susan Brown of Brown Training Associates in Florida, the best public forum for discussing environmental risk is an “open house” that is oriented toward individual conversations with a concerned party that focus on specific topics/issues as opposed to unstructured “town meetings” which lend themselves to chaos. The presenter should plan and prepare the key messages, which should be 12 words or less and address the specific concerns and/or issues affecting the audience. The presenter should anticipate questions and prepare responses.

The three principles of risk communications should be clearly understood by presenters so they can work to overcome gender-based weaknesses. The three principles are:

- $P=R$ or perception equals reality;
- $G=T+C$ or the goal is to gain trust and credibility; and
- $C=S$ or communication is a skill.

Risk communication—an interactive process with the exchange of information and opinions conveying messages about risk—can be applied in situations where low trust, anger, and confusion reign. The benefits of effective risk communications include:

- Improved decision making;
- A better educated public;
- Increase or decrease of anxieties;
- Appreciation of limited resources and difficult choices;
- Increased governmental coordination; and
- The development of working relationships.

II. Qs and As

Q: How can regulators hold an “open house” when they’re required by law to provide a public notice/meeting?

A: The regulations typically require 1) an opportunity for people to speak; 2) an opportunity for questions and answers and 3) a formal record of the meeting. The regulations typically do NOT spell out the exact approach to conduct these meetings/notices, so presenters have flexibility regarding the design/format of their presentations.

Q: How can regulators deal with an invitation to a meeting when they know that they will not be in control?

A: Presenters should make sure that they address the concerns of the audience; anticipate questions; know the issue(s), and develop a clear and concise message. If all else fails, do NOT attend but develop an alternative approach (e.g., an article in the local newspaper or conduct an “open house”).

III. Suggestions regarding the UST program or requests for assistance.

None.

Getting Over the Hump: State RBCA Implementation

Moderator: Steven McNeely (OUST)

Time: Tuesday, 11:00 a.m. - 12:30 p.m.

Notetakers: Maureen Lewison, Richard Mattick, and Steven McNeely

Presenters

Geoff Gilman	Amoco
Annette Giuseppe-Elie	Exxon
Mark Malander	Mobil

I. Most important issues or topics actually discussed or presented during this session.

The Partnership In RBCA Implementation (PIRI) is shifting its primary goal from the delivery of the American Society for Testing and Materials (ASTM) risk-based corrective action (RBCA) training to the support of States as they implement RBCA. PIRI conducted two workshops (*i.e.*, on January 28, 1998 and March 19, 1998) to identify general areas in which more needs to be done. The conference session was designed to obtain additional input on those areas of need, so that PIRI could finalize the recommendations and develop specific plans of action. Attendees at the session joined one of the following groups.

- Information Management. Mark Malander and Rick Mattick led this group. The discussion centered on practical procedures (*e.g.*, databases, homepages, bulletin boards) to manage and disseminate information regarding State risk-based decision-making policy decisions and implementation tools and approaches.
- Resource Leveraging. Jeff Gilman and Steve McNeely led this group. The discussion was on practical methods to identify, consolidate, and exchange information, products, and services to reduce implementation support costs associated with the development and operation of State RBCA programs.
- MTBE/TPH. Annette Guisepppe-Elie and Maureen Lewison led this group. The discussion focused on practical methods, products, and services needed by States to advance the understanding and use of these topics in a RBCA process.

Attendees were asked to identify up to five "key" elements they needed in a particular area for successful implementation of RBCA. Then they were asked to recommend practical procedures for implementation; identify applicable PIRI resources (*e.g.*, roles/responsibilities, available funding options); and identify specific deliverables to address each of the "key elements."

The session was designed to enable all groups to share and critique recommendations; however, attendees elected to remain in separate groups. Each group's recommendations were listed on flipcharts and will be transferred to standardized report forms for distribution. Topics which were not identified during the national workgroup sessions but which still impact Risk-Based Decision Making (RBDM) implementation at the State and/or Regional level will be addressed at Regional Planning Meetings, sessions comparable to the PIRI workshops referenced above. The Planning Meetings will allow respective PIRI members (*e.g.*, Federal, State, private) to develop a plan of action for a particular Region.

II. Qs and As.

- Q: How will the National PIRI members develop the implementation schedule to address each of the breakout session recommendations?
- A: The session coordinators will work with their assigned RBCA Team members to develop an initial implementation schedule and will distribute it, along with conference meeting notes, to secure necessary input from the States. Parties responsible for recommendations which received strong support during these meetings will proceed with the preliminary tasks required to implement their projects and will develop a project schedule. Once PIRI has received the final comments, it will develop and distribute a comprehensive plan.

III. Suggestions regarding the UST program or requests for assistance.

Please contact the EPA breakout session coordinator for a copy of the session notes.

Getting Over The Hump: Fate-and-Transport And Vapor Migration Into Buildings

Moderator: Richard Mattick
Time: Tuesday, 2:00 - 3:30 p.m.
Notetaker: Richard Mattick

Presenters

Janine Dinan *dinan.janine@epa.gov*
John Fitzgerald *john.fitzgerald@state.ma.us*
Blayne Hartman *bit@te6env.com*
James Kennedy *jkennedy@fwenc.com*
Craig Mann Environmental Quality Management

1. Most important issues or topics actually discussed or presented during this session.

A draft of the *RBCA Fate-and-Transport Modeling Compendium*, which was developed under a cooperative agreement between EPA and the American Society for Testing and Materials, was presented. The *Compendium* describes the types of fate-and-transport models available for all pathways, summarizes them, and compares the more popular fate-and-transport models used in RBCA assessments. The *Compendium* includes the information necessary to use the models and describes a process for selecting the models most appropriate for Tier 2 and Tier 3 RBCA evaluations.

EPA's Office of Emergency and Remedial Response (OERR) is developing a computer model that allows for site-specific application of the Johnson and Ettinger model to estimate vapor to indoor air intrusion. The computer model will allow for finite sources, adjust for different soil types, adjust for differences in the saturated and unsaturated zones, and allow for inputs of different building characteristics. The model does not account for biodegradation.

The two biggest physical phenomena driving vapor migration from soil into indoor air are diffusion through the soil column to the "zone of influence" beneath the building and then convection into the building. The most sensitive parameter governing diffusion is soil moisture content; the most sensitive parameter governing convection is soil vapor permeability, which is based on soil type.

The Massachusetts Department of Environmental Protection (MDEP) performed a field study to evaluate the fate-and-transport model parameters for groundwater to indoor air standards. Results of the study indicated that indoor air/soil gas attenuation coefficients appear to be higher than the value assumed by MDEP in calculation of their standards for chlorinated VOCs, while field attenuation coefficients for non-chlorinated VOCs appear to be consistent with their assumed value. Non-chlorinated VOC partitioning between groundwater and soil gas was observed to be one to two orders of magnitude lower than estimated, apparently as a result of biodegradation in the vadose zone.

There are three methods—active, passive, and surface flux chambers—commonly employed to measure soil vapor contamination. Each of the methods has advantages and disadvantages for the determination of the upward vapor risk. In general, the active soil vapor method offers less uncertainty and more versatility than the other methods.

II. Qs and As.

Q: What are some of the more important considerations when you are measuring soil vapor concentrations to determine potential risk in indoor air?

A: Important issues for consideration include sampling depths, spatial distribution of locations, and multiple samples taken, for example, before and after a rain event and at different times of the year.

Q: What are the major sources of uncertainty in the Johnson and Ettinger model?

- A: 1) Area of cracks in the basement floor. When the source is very close to the building, the cracks do not matter much because the transport is convection dominated. But when the source is at depth and the transport is diffusion, the area of the cracks makes a big difference. Our assumption is conservative but not “worse case.” For example, the older homes in New England have foundations made out of stones. In addition, our model does not account for floor drains that do not have a water-filled trap (like a P-trap).
- 2) Pressure difference between indoor and outdoor air. Pressure differences can range from less than 1 Pascal when windows and doors are open to as much as 20 Pascals when windows and doors are closed (*i.e.*, during the heating season). We used 4 Pascals, which is the upper end of the average range.
- Q: What is the difference between water-phase diffusion and vapor-phase diffusion?
- A: Water-phase diffusion is about 4 orders of magnitude less than vapor-phase diffusion.
- Q: How can you account for biodegradation when you are modeling this pathway?
- A: Biodegradation may be very important for petroleum compounds, but it is really not much of a factor for halogenated solvents. To account for biodegradation on a site-specific basis, you need a lot of complex data. For example, aerobic degradation is influenced by oxygen, carbon dioxide, methane gradients, soil moisture gradients, and microbial types and counts. Even after you measure all that you have to figure out whether degradation rates are 1st order, 2nd order, or something else. You should also account for other loss vectors such as leaching and volatilization. Paul Johnson is currently working very hard on these issues for API.
- Q: How and when can we get a copy of EPA/ASTM’s *RBCA Fate-and-Transport Model Compendium*?
- A: The final Compendium is targeted for completion in early summer. OUST will distribute it to all State UST/LUST programs and post it on the Internet at the OUST website (www.epa/OUST). A working draft will be available for you today to look over at the State Fair. In addition, you can sign up to review the compendium and provide comments to EPA in early May on the first draft.
- Q: (To John Fitzgerald) I understand that your field study found that the degree of VOC partitioning between groundwater and soil gas was 1 percent of the predicted theoretical value at equilibrium conditions using Henry’s Law Constant (H) with a high standard deviation. What would account for this high variability?
- A: Soil moisture, weather issues, and data quality control issues. We took what we had from our files, which was limited. Even with this high standard deviation, we did see trends.
- Q: Which type of vapor sampling method is the cheapest?
- A: If you are under a tight budget constraint, surface flux chambers may be an option to consider. They can be very easily made for under \$10 (or bought for considerably more) and, therefore, can provide wide spatial coverage/sampling points per unit cost.

III. Suggestions regarding the UST program or requests for assistance.

None.

Monitored Natural Attenuation

Session Moderator: Matt Small (Region 9)

Time: Wednesday, 8:30 - 10:00 a.m.

Notetaker: Peg Rogers

Presenters

Mike Martinson *MIKEMA@deltaenv.com*

Matt Small *small.matthew@epa.gov*

Hal White *white.hal@epa.gov*

I. Most important issues or topics actually discussed or presented.

Matt led a philosophical discussion of how Monitored Natural Attenuation (MNA), Remediation by Natural Attenuation (RNA), and Risk-Based Corrective Action (RBCA) interrelate. The advent of RBCA has changed the question "how much contamination can we remove" to "how much contamination can we safely leave in place." This is a subtle but fundamental shift in our remediation paradigm. What we must never allow is changing the question again, so that it becomes "how much contamination can we allow to occur."

Hal followed with a comparison of the EPA Directive on MNA and the ASTM RNA Standard including an explanation of the differences between the two. EPA was represented on both workgroups that developed these guidances, so there are some commonalities. In general, the MNA Directive is more stringent than the RNA standard. This disparity is mostly the result of the fact that the Directive covers both soil and groundwater plus contaminants found at LUST as well as RCRA corrective action and Superfund sites, whereas the RNA standard is strictly for petroleum in groundwater. The primary differences between these documents are in the areas of source control measures (MNA requires them in all cases), thoroughness of site characterization (MNA requires comprehensiveness), contingency plans (MNA requires evaluation in all cases), and site closure (MNA requires long term monitoring until and for a period after cleanup levels have been achieved).

Mike Martinson of Delta gave a presentation on the results of an RNA Survey of 51 States (done in conjunction with UTTU) which revealed 1) that most States had or planned to establish statutes, regulations or guidance on RNA and 2) that MTBE is an unexpected problem which is impacting both State LUST programs and State Funds. Twenty-four States have MTBE regulations; 24 do not; 9 States will adopt MTBE regulations in 1998-1999; and 6 States will adopt MTBE regulations after EPA issues its final health risk advisory and/or establishes an MCL for MTBE. To obtain a copy of the survey results, contact Mike at 612 697-5165. Then Matt talked about a survey of 42 States on "Long-Term Management of Residual Petroleum Hydrocarbons."

II. Qs and As

Q: Why are there differences between the EPA Directive on MNA and the ASTM Standard?

A: Mostly because they address different contaminants. The biggest difference is with NFA letters. EPA does not permit sites to close until after cleanup levels have actually been achieved.

Q: What is the legal significance of the Directive on a State?

A: It is guidance that explains how EPA will exercise its authority in implementing MNA remedies.

Q: Did the UTTU/Delta Survey address whether RNA would be allowed for offsite contamination?

A: It did not ask that question specifically, but it seems clear that States have contingency plans for offsite contamination such as various institutional controls.

Q: Have States developed protocols for use of RNA?

A: Yes, usually they are found in State guidances; they are generally site-specific; 17 States have guidances, 14 more are developing them.

Q: With RBCA, we are now seeing MTBE. How do we (the States) handle taste and odor?

A: EPA can't enforce a policy based on "aesthetic" characteristics such as taste and odor. But, because MTBE has such low taste and odor thresholds, a water supply may be ruined even if the water isn't actually harmful to human health. Water companies won't be able to sell MTBE contaminated water that tastes and smells bad at the tap.

Q: Do long-term cleanup approaches (MNA) satisfy bankers and realtors?

A: Active long-term cleanup approaches do; passive controls (*e.g.*, institutional controls) do not. Some State Funds are not reimbursing for long-term active cleanups. Some O/Os want immediate cleanup technologies used but are forced to use long-term methods and thus are not getting full value for their property when they sell.

Q: Has NA been challenged in court as a viable cleanup approach?

A: Matt knew of none yet. A State participant said his State has a third-party suit coming up.

Q: Any thoughts on deed restrictions on adjacent property?

A: A good discussion on various institutional controls followed. Oregon had a situation in which two adjacent properties had deed restrictions. An Arizona participant said that only the owner can impose a deed restriction on his own property; he cannot do anything on adjacent property.

Q: Are third parties driving RBCA levels of cleanup (MCL's)?

A: No standard practices are.

III. Suggestions regarding the UST program or requests for assistance.

I didn't hear any specific requests for assistance during this session. However, I got the impression that States are waiting for EPA to establish a MCL for MTBE and that they want EPA to do so.

TPH: Past, Present, Future

Moderator: Hal White (OUST)
Time: Wednesday, 10:30 -12:00 noon
Notetaker: Kate Becker

Presenters

John Fitzgerald *John.Fitzgerald@state.ma.us*
Hans Stroo *hstroo@retecinc.com*
Stephen D. Robb *srob461@ecy.wa.gov*

I. Most important issues or topics actually discussed or presented during this session.

Hans Stroo is a member of the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG or workgroup), an *ad hoc* group of regulators, academicians, industry representatives, and federal workers from DOD and DOE. He focused on the expectations of a risk-based approach with its site-and product- specific criteria and explained the workgroup's technical strategy for establishing soil cleanup levels at petroleum-contaminated sites. Called the "TPH Fraction and Indicator Method," it starts with the preparation of a user friendly summary of the composition of petroleum products based on their fate-and- transport, analysis of fractions, and toxicology. The next tasks are to select toxicity criteria for fractions defined by fate-and-transport, evaluate the adequacy of the toxicological data base for risk-based criteria and fill critical gaps, incorporate the risk-based criteria into the ASTM/RBCA framework, and publish documents. He discussed the specifications of fractions by noting their differences in mobility, the necessity of separating aliphatics and aromatics, fractionation based on mobility of a substance in a specific environment, determination of properties using correlations with equivalent carbon number. He discussed changes in fraction distribution due to weathering and TPH fractions vs hazard quotient for leaching to groundwater.

Steve Robb from the Washington State Department of Ecology talked about his State's initiative to determine site-specific cleanup levels for TPH that are compatible with the Model Toxics Control Act (MTCA). He commented briefly on "the regulatory paradox," which is that as consistency goes up, flexibility goes down and vice versa. The workgroup has defined "dose" as intake divided by concentration and "risk" as dose divided by toxicity. "Concentration" is risk times toxicity divided by intake. The TPH Initiative, which started in 1997, has moved to the "surrogate" approach, which has one compound that represents the group. The most extreme compound was selected: Hexane for aliphatics and pyrene for aromatics. Some questions concerning groundwater that must be asked are: What level of contamination do we protect to? What is the importance of resources? What is the importance of the resources in question? What is the importance of the aesthetics? What is the role of natural remedies?

John Fitzgerald from the Massachusetts Department of Environmental Protection (MDEP) discussed "Beyond TPH." As of Halloween 1997, the VPH/EPH Approach has been in effect in Massachusetts. The problem, as MDEP saw it, was that petroleum is several compounds so the indicator only approach is not protective because BTEX, MTBE, and PAHs are only a small percentage of petroleum products. The premise MDEP used was that petroleum is mostly made up of aliphatic and aromatic hydrocarbons, that aromatics are more toxic than aliphatics, and that the toxicity of aliphatics is a function of the number of carbon atoms. The concept MDEP employed was to break up TPH into collective fractions of aliphatic and aromatic compounds, break up aliphatic fractions by carbon number, and assign a toxicity value to the fractions based upon a "surrogate." The toxicological approach assigned reference daily doses; the regulatory approach allowed for the identification and quantification of indicator compounds (e.g., BTEX, MTBE, PAHs). MDEP made it work by developing and validating analytical methods to provide needed data; developing generic Tier 1 cleanup standards for aliphatic/aromatic fractions; developing implementation guidance, and conducting training and outreach.

II. Qs and As.

Covered in above paragraphs.

- III. Suggestions regarding the UST program or requests for assistance.
- None.

Bye, Bye Magic 8-Ball, Hello INDIPAY!

Moderator: Sandy Stavnes (Region 8)

Time: Monday, 1:00 - 2:30 p.m.

Notetaker: Mark Barolo

Presenters

Sandy Stavnes
Donna Arthur

stavnes.sandra@epa.gov
arthur.donna@epa.gov

I. Most important issues or topics actually discussed or presented. during this session.

INDIPAY was developed by OECA to help determine an individual's ability to pay. Cost recovery is not fun or easy, but it is required. INDIPAY is a user-friendly tool that you can use to help you make your decisions. It provides a standard and consistent approach that uses financial disclosure information and past tax records. (Note: ABLE, MUNI, and other tools are available to determine ability to pay for corporations and local governments) INDIPAY is modeled after the process that banks use to evaluate whether a potential borrower qualifies for a loan. INDIPAY compares assets (e.g., house equity, income, autos) with debts/liabilities (e.g., rent/mortgage, loans, living expenses) and gives a conservative assessment of what the individual can afford to pay.

While INDIPAY can provide you with useful information, you need to consider other factors in deciding whether to pursue cost recovery, and how much to pursue. EPA's Region 8 does not render someone homeless, does not go after widow(er)s or orphans, usually does not go after retirement income, and takes into consideration the age and health of the individual in question.

There are a number of things to remember when gathering and using financial information. An individual can receive income from various sources such as their own savings, a parent/affiliate, arms-length third parties, or fairy godmothers. Although income tax statements can be used to obtain standard information, the information is frequently dated, the statements do not include assets or nontaxable income, and people have been known to "under-report." Financial statements do include assets and nontaxable items, and an audit, if one has been performed, can provide considerable information; but these, too, can be somewhat dated. Bank statements show the most recent account activity, but some statements may be missing, and these statements do not show direct payments by outside sources of income. Finally, the Internet can provide significant amounts of information with a rapid response time, but verifying the accuracy of the information can be difficult.

In summary: when reviewing ability-to-pay documentation—trust no one, think like the respondent, think like a detective, and remember that it is human nature to fudge (so fudging does not necessarily implicate someone).

II. Qs and As

Q: How do you know if you are getting all the information?

A: You don't. Try to use common sense. Does something appear to be missing? If something seems strange, it probably is—trust your intuition.

Q: Has anyone disputed the results of INDIPAY?

A: Not yet. You can tell the owner/operator that if he/she has additional information, you will recalculate. Since INDIPAY was created by EPA's Office of Enforcement and Compliance Assurance, it has been readily accepted.

Q: Can you use this tool if someone is undergoing bankruptcy?

A: Talk to your Attorney General. It may be possible as not all assets are tied up during bankruptcy.

III. Suggestions regarding the UST program or requests for assistance.

None.

Internet Chat Room

Organizers: Jay Evans (OUST), Ben Thomas (Alaska), Hal White (OUST)
Time: Monday, 3:00 - 5:00 p.m.
Notetaker: Debbie Rutherford

Presenters

Chris McLain	<i>chris.mclain@pca.state.mn.us</i>
Staci Munday	<i>munday.staci@ev.state.az.us</i>
Jenny Smith	<i>jennifer_smith@mnenv.state.mn.us</i>
Ben Thomas	<i>bthomas@envircon.state.ak.us</i>
John Welch	<i>welchj@gwgate.swrcb.ca.gov</i>
Hal White	<i>white.hal@epa.gov</i>
Rebecca Wiegand	<i>rwiegand@mt.gov</i>

I. Most important issues actually discussed or presented during this session.

UST program "Webmasters" demonstrated how they use the Internet to communicate and interact with the regulated community and the general public, thereby reducing demands on UST program staff time. Applications included:

- Providing actual site-specific information. Minnesota posts, in a searchable format, information on over 10,000 leak sites and information on compost sites. New Mexico posts lists of leak sites, makes lists of owners/operators available in various formats, and provides raw monitoring well data for state-lead sites.
- Presenting regulations and guidance so as to capitalize on electronic capabilities. California formatted its regulations to allow use of a "find" function, cut-and-paste features to create new documents, and links to historical amendments. Arizona pages link to USEPA sites. USEPA links to historical documents, provides an index, and allows users to search by subject.
- Conducting on-line outreach. All sites publish fact sheets, newsletters, "Frequently Asked Questions," etc. Arizona lists upcoming seminars and allows on-line registration; Minnesota allows on-line subscription to its newsletter. Arizona also enables users to register on-line to be included on an e-mail list, then routinely communicates via e-mail with everyone on the list. Montana (a State fund site) posts schedule of board meetings, agendas, and minutes from previous meetings. New Mexico lists firms employing certified scientists and publishes requests for proposals which contractors check frequently.
- Providing forms. Arizona provides forms in .exe format, enabling users to complete forms electronically. Montana publishes forms in both HTML format (on separate pages to facilitate printing) and in PDF with a link to an Acrobat reader. Since many forms require certification/signature, users still need to mail in hard copies.

Providing contacts. Most sites provide contact names (and Internet addresses for queries), Hotline numbers, and other sources of information. Montana provides names of case managers for each case listed in its database.

II. Qs and As

Q: What were greatest difficulties to overcome in establishing a website?

A: Greatest obstacle was management's lack of understanding or appreciation of what a website can do and contribute. Also important to have a clear idea of how you will organize your site and what you want it to do before you start building it.

Q: Given the size of the UST community, do you think UST sites are visited any more than are other State sites?

A: We think so, but this is difficult to document. A number of states show more "hits" to the UST page than to their main page. Can't track who may have gone from the main page to the UST page.

Q: What "search engines" are states using for their sites?

A: Search engines are programs that catalog information on a web site. Some web server software comes with a search engine package while others have to be programmed using a specific type of programming language. Although search engines offer the most powerful tool for finding information on a web site, they can be complicated to develop because specialized programming expertise is required. If a programmer and the software aren't readily available, some of the same utility can be achieved by using an index file that is linked to various files on the web site. To be useful, an index should be as comprehensive as possible, which requires knowledge of the topic areas covered by the web site (and the UST/LUST program). Indexes require routine maintenance to keep them up to date, which can be time-consuming. You can also register your site with the many "commercial" search engine sites that already exist on the web (*e.g.*, AltaVista, Excite, Yahoo, Lycos). There is a 4- to 6-week delay usually, but after your site is indexed, people who use these search engines will be able to find your information.

FY 1999 - 2005: A Program Planning Brainstorm

Moderator: Bill Lienesch (OUST)

Time: Tuesday, 8:30 - 10:30 a.m.

Notetaker: Bill Foscett

Presenters

Audience participation in Q/A and comment format

I. Most important issues or topics actually discussed or presented during this session.

Double-wall USTs (secondary containment) should be required by Federal regulation. Leak detection now allowed in Federal regulations on single-wall USTs is not as reliable as expected and overall costs of double-wall USTs are lower than originally believed. Insurance costs go down significantly for double-wall tanks. States asked OUST to undertake Federal rulemaking to require double-wall tanks to hit window-of-opportunity for replacement market for USTs installed about 25 years ago. Some States that want to require double-wall tanks are prevented from doing so because they cannot be more stringent than EPA requirements.

Compliance with current tank technology requirements would be significantly increased by stopping product deliveries to non-compliant tanks. Fifteen States hold marketers responsible for delivery of product into non-compliant USTs. On-site inspections also boost compliance.

Proper operation of "in-compliance" UST systems remains a problem. Improperly managed electronic monitoring systems give a false sense of security. On-site employees who actually operate the UST system are often high-turnover, minimum-wage workers who lack both training and incentives to operate the UST system and leak-detection systems as they were designed to be operated. A way to improve training delivery to high-turnover employees is needed. The training needs to be cost-effective (for the employers) and easy to update. Training should be tiered according to the level of responsibility of the trainees.

Redevelopment of former UST sites may be an emerging issue. (Real-estate transfers can move former gas stations back on local tax rolls.) Another aspect of redevelopment is Brownfield funding and issues. USTs are involved in some Brownfields sites. However, because the emphasis of the Brownfields Initiative is on generating new jobs, it typically involves abandoned industrial sites rather than the small sites formerly occupied by gas stations. Because of this, it can be difficult for states to get Brownfield funding for former gas stations. Forms of public-private partnerships seem a more promising way for getting former gas-station sites redeveloped.

Some States report that ASTs are being favored to replace UST systems because the ASTs are regulated less stringently. Some State UST programs are now being assigned responsibility for regulation of ASTs which had traditionally been the responsibility of Fire Marshals. States believe stronger Federal leadership is needed on ASTs and because AST responsibility is moving to State UST programs, States believe OUST should take the Federal lead on AST regulation.

II. Qs and As.

Q: How many States cannot be more stringent than Federal requirements?

A: 15.

Q: How much more are double-wall UST systems costing now?

A: About 25 to 30 percent more at purchase; but this is offset somewhat by much lower insurance costs for the owner/operator of double-wall systems.

Q: How many States put responsibility for delivery of product to non-compliant USTs on the delivery firm?
A: 15.

III. Suggestions regarding the UST program or requests for assistance.

- States strongly recommend that OUST promulgate rules to require double-wall UST systems.
- States recommend that OUST take Federal leadership in regulation of ASTs because many State UST programs are being assigned responsibility for ASTs.

Hazardous Substance Tanks: The Forgotten Universe

Moderator: Kathy Stiller (Delaware/ASTSWMO)

Time: Tuesday 11:00 - 12:30 p.m.

Notetaker: Will Anderson

Presenters

Steven Burton

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I. Most important issues or topics actually discussed or presented during this session.

Hazardous substance tanks are often overlooked by UST/LUST regulators. These substances vary tremendously in their composition, reactivity, and toxicity. While most of these tanks are ASTs, States must include them as they address the issue of threats to human health and the environment holistically.

The State of New York regulates hazardous substance tanks and has learned many important lessons along the way including the fact that a large percentage of leaks and contamination are the result of poor management practices. Also, the continuing development of new technologies necessitates the need for regulatory flexibility. Lastly, it is equally important to set specifications for the storage and transfer areas (*e.g.*, containment, shelters).

When inspecting hazardous substance tanks, one must remember that the safety concerns are even greater than when one inspects a petroleum UST. Inspector should:

- Identify ALL stored substances (past and present);
- Obtain and read material safety data sheets (MSDS); and
- Know relevant safety procedures and facility safety rules.

Contamination from hazardous substance tanks can require different site investigation techniques (*e.g.*, sampling). Also, the investigation approach may differ if the specific gravity of the substance is >1 (*i.e.*, contaminant will NOT float on top of the water table; rather, it will sink). Lastly, owners/operators must determine if groundwater has been impacted within 45 days.

A greater level of integration and communication between regulatory agencies at the State level is needed to define the roles and responsibilities for corrective action so that all parties are aware of their authorities and jurisdictions. A small survey by Vermont showed that each State questioned divided the work and responsibilities among its agencies (*e.g.*, UST/LUST, RCRA, Superfund) in a different manner.

II. Qs and As.

Q.: Why are there no FR requirements for hazardous substance tanks?

A: In 1989, OUST published an Advanced Notice of Proposed Rulemaking (ANPRM) regarding a possible FR regulation for Hazardous Substance USTs. In the ANPRM, OUST asked for data regarding the number of these USTs; a rationale for setting limits (*e.g.*, by toxicity); any limits that should be set (*e.g.*, \$1 million per occurrence); along with other data. No one provided any new data about the number of USTs; there was a great deal of conflicting advice regarding the last two questions. Because there did not seem a great deal of urgency or need (expressed by the States at the time) for a FR regulation (*i.e.*, leaks from these tanks were being cleaned up with other means), OUST focused on more important issues and did not initiate a full-fledged rulemaking effort. If the need does arise, OUST will consider developing a FR rule.

III. Suggestions regarding the UST program or requests for assistance.

A number of States were concerned about the need to develop FR requirements for hazardous substance tanks.

Regulator's Role In Recognizing And Preventing UST Cleanup Crime and Fraud

Moderator: Carol DeVore (Ohio) and Bill Foskett (OUST)

Time: Tuesday, 2:00 - 3:30 p.m.

Notetaker: Barbara Howenstine

Presenters

Jana Harris	<i>j.harris@occmil.occ.state.ok.us</i>
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I. Most important issues or topics actually discussed or presented during this session.

It has been estimated that 20 to 40 percent of State fund reimbursements for UST cleanups may be for fraudulent or criminal claims—costing States approximately \$176 to 352 million in 1997. Per incident value of UST cleanup fraud/crime may range from \$500 to 1,000,000. Most—but not all—of 40 State UST cleanup funds are believed to be afflicted by cleanup fraud or crime. A work group has been convened by OUST to study the problem of fraud and crime in UST cleanup programs.

The crime and fraud can be either “white collar” or “environmental.” The most common types are time fraud and/or billing fraud, fraudulent third-party claims, improper activities by program staff, and design fraud. There may be collusion of UST owner/operators and cleanup contractors. Or, government staff may be motivated to collude in cleanup fraud or crime by the prospect of personal financial gain. In “design-to-fail” fraud, the cleanup contractor designs cleanup systems to continually fall short of contamination reduction goals and thereby generate an on-going revenue stream to the contractor.

Regulators are affected by this fraud and crime. “Design fraud” may mean the review of a workplan over and over again—with no “end” in sight. This often means that regulators spend more time at the desk than out inspecting. Inaccurate and unreliable data may result in higher contamination levels being left at a site. The regulator is often blamed for an untimely cleanup. Unrestrained fraud and crime could jeopardize the solvency of State cleanup funds. Staff morale can suffer if perceived fraud and crime are allowed to continue unchallenged.

What can regulators do about fraud and crime? Open and maintain a dialog with your State’s Fund Administrator: Learn what problems your State fund personnel are encountering as they process claims; understand the effect of these problems for both the regulator and administrator; and jointly identify those sites with potential long-term cleanups and high costs. Look for inconsistencies and contradictions. Don’t let the small size of something go by—it could lead to bigger things. Try to be sensitive to situations and decide whether the incident involves *intentional*, purposeful acts to defraud or just sloppy, incompetent work. Keep a record of pertinent dates, times, and related information. Identify and inform the tank owner/operators and the contractor/consults of corrective action problems early on. Inform appropriate individuals (*e.g.*, supervisors, law enforcement personnel, fund administrators) of possible fraud as soon as possible. Implement a regulator work group as part of a fraud task force.

And, consider some programmatic changes as well. States can become proactive in solving this problem. Most States still implement a “time and materials (T&M)” cleanup process. An alternative is “pay for performance” (PFP), in which the contractor is paid based on his performance in meeting cleanup goals. The benefits of PFP are: It puts greed to work for the State; there is less claim review time required; cleanups take less time; there is less opportunity for fraud; and it is easier to detect. Also, reimbursement to the contractor is much quicker and requires less paperwork; targets are set early in the process. Another thing you can do is find out where resources are to help you. Can you and law enforcers work closer together? (In Ohio, we work with our local prosecutors.) Some States provide training on awareness of issues in environmental criminal investigations. You can train your staff in crime and fraud detection as well as documentation techniques.

II. Qs and As.

Q: What type of fraud do you find?

A: The cleanup contractor seeks reimbursement for work that could not possibly have been done or for equipment not actually used at a site. For example, the contractor might seek to charge the State for the same technician having done 18-hours of work on the same day at three different sites each 200 miles apart. Unless you just happen to have the same State person working these same three sites, it's relatively easy for this to go undetected. Or, a contractor may claim costs for equipment not actually used on the site. Fraud--white-collar crime-- can turn into environmental crime when a third-party plants contamination on his property in order to claim compensation from the State for third-party damages. This is a built-in weakness of T&M cleanup contracts--there is an incentive to cheat the State. There is no incentive for contractors to commit this kind of fraud in a PFP cleanup, but they might try to submit falsified monitoring data to get their performance payment. The crux of PFP is how carefully and effectively you monitor performance. We believe that some of the questionable contractors move from State to State. There is a need to take "dubious actors" out of practice. Fraud in T&M can come about because regulators don't have the time to thoroughly study details. Also, State legislatures may put pressure on you to process T&M reimbursement claims quickly, so you don't have time to check dubious claims.

Q: What has the work group done?

A: We have drafted a "model" affidavit for cleanup contractors to submit with their claims to State funds. We have developed a list of regional contacts and resources to assist States regarding suspected cleanup crime and fraud and outlined the initial elements of a strategy for alerting and sharing information with other UST regulatory and cleanup fund officials regarding cleanup fraud and crime. We as regulators must work together, share information, and help each other combat fraud and crime.

III. Suggestions regarding the UST program or requests for assistance.

None.

The State of Financial Responsibility and Insurance

Moderator: Mark Barolo
Time: Wednesday, 8:30 - 10:00 a.m.
Notetaker: Bill Lienesch

Presenters

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I. Most important issues or topics actually discussed or presented during this session.

In the late 1980s, there were over 10 relatively large insurance companies providing underground storage tank coverage. That has been reduced by about 50 percent. In the future, however, when risks of release are reduced as owners and operators comply with the 1998 deadline, more companies are expected to provide coverage.

In general, it is best if owners and operators buy insurance from an "A" rated company. There is little likelihood that such a company would become insolvent.

As States transition out of State funds, it is very important that they do a significant amount of outreach to owners and operators. States will need to tell owners/operators how they can find coverage from insurance companies, including providing the names and phone numbers of insurance companies offering UST coverage in the State. States should also consider phasing in the transition to insurance over time.

In general, it is extremely difficult for sites that are temporarily out-of-service to get insurance. When it is possible, the premiums are extremely high.

States should be very rigorous in their analysis of documents provided by owners and operators who claim they have enough net worth to self insure. Unless an owner/operator is a major corporation, it is very difficult to meet the requirements of self-insurance.

II. Qs and As.

Q: What criteria do underwriters use in determining premiums?

A: There are various criteria including the age of the tank, depth to groundwater, and proximity to drinking water wells. Perhaps the most important is the leak detection method used by the owner/operator.

Q: Some potential insureds are concerned that the insurance companies will not pay off if there is a release. Is this a reasonable concern?

A: In general, this is not a concern. If the release is clearly old and predates the policy, however, then the insurance company will not pay for remediation. If it is uncertain, then the insurance company will probably pay. In part, this decision is influenced by the possibility that the owner/operator will take the insurance company to court and there will be legal costs to pay.

III. Suggestions regarding the UST program or requests for assistance.

None.

Pay for Performance: Show Us Results and We'll Show You The Money!

Moderator: Bill Foscett (OUST)
Time: Wednesday, 10:30 a.m. - 12:00 noon
Notetaker: Will Anderson

Presenters

Mark Berenbrok *berenbm@columb26.dhec.state.sc.us*
Bill Foscett *foscett.william@epa.gov*
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I. Most important issues or topics actually discussed or presented during this session.

The results are in and pay for performance (PFP) cleanups are indeed better, faster, and cheaper! Five States (*i.e.*, Florida, Georgia, Oklahoma, South Carolina, Utah) currently employ some form of PFP, which has proven to be a win/win/win situation for State funds, owners/operators, and consultants alike. PFP dictates that payments be made to the contractor when specific cleanup goals are met, thereby creating an incentive to complete cleanups faster. The system pays for results and can even be used as part of a cleanup (*e.g.*, reduce extremely high levels). Cleanups are ahead of schedule, and the cost has decreased. Lastly, State fund payments to cleanup contractors are more timely and require less paperwork.

South Carolina's model involves a standard Statement Of Work (SOW) for site characterization followed by contractor bids for the cleanup. (South Carolina also has a contractor certification program). Low bidder receives a fixed price contract and must float a performance bond. Verification wells are included to monitor end point and rebound. South Carolina also has PFP statutes.

Oklahoma chose to implement PFP on 17 of its most difficult sites. The State sought to involve all stakeholders—including State auditors and legislators as well as tank owners and consultants—when developing its process. Oklahoma has a voluntary PFP program.

OUST is sponsoring PFP workshops, has produced a PFP guide, and has created a PFP website (<http://www.epa.gov/oust/pfp>) with a database of PFP cleanup information.

II. Qs and As.

None

III. Suggestions regarding the UST program or requests for assistance.

None.